Great pressure contrasts and active disturbances marked the first half of the month. The period from the 7th to the 10th was stormiest, and on the 9th the LOW in the northeastern Atlantic attained its maximum development, with a central isobar of 28.2 inches clearly identified in the data reported. At the same time a well defined HIGH was present on the American coast, so that a pressure gradient of more than two inches existed between the Grand Banks and the northeastern Atlantic. The situations of the four days November 7 to 10 inclusive, have been chosen for reproduction as Charts VIII to XI, appended to this issue of the REVIEW.

The latter part of the month was, in general, more equable, but was not without several short periods of rather active disturbance. The storm developments of this period arose in several instances well southward in the Atlantic, one being a small but clearly identifiable depression appearing on the 21st southwest of the Azores, and another a similar disturbance, reaching its full development about the 23d, southwest of Bermuda. Both of these LOWS moved northward to unite with more extensive depressions over the northern Atlantic.

Gales and tropical disturbances.—As might have been expected from the general pressure situation outlined above, the stormiest part of the Atlantic during November was north of latitude 45° and east of longitude 30°, in the region which was most persistently under the influence of deep barometric depressions. However, gales occurred on a few days in other areas westward to the Grand Banks, and thence southwestward toward the Bahamas.

The stormiest days on the main trans-Atlantic routes were the 3d and the 7th to the 10th and the 13th to the 15th, inclusive. Winds of whole gale force were reported at places along the routes on each of those days, and hurricane force was encountered by the German ship *New York*, westbound near longitude 25°, on the night of the 8th, and also by the Belgian steamer *Emanuel Nobel*, eastbound on the 13th, in the same area. A number of liners reported delays in crossing due to the heavy weather of this period. A British schooner of 190 tons had to be abandoned by her crew of seven on November 17th in mid-Atlantic due to the long continued storminess of the preceding weeks.

At the beginning of the month a mild disturbance over the western Carribbean Sea produced a distinctive cyclonic circulation which was reported of gale force on the 2d by the Panamanian ship *San Blas*, but the disturbance failed to develop a definite center of low pressure. About a week later, another gale was experienced in the western Caribbean, and news dispatches reported extraordinary rains and storm damage in Honduras, but these appear to have been due to an intensification of the trade winds rather than to a true tropical disturbance.

Fog.—November was almost entirely free from fog over most of the Atlantic, Gulf, and Caribbean waters. Practically all fog reports at hand were received from the region adjacent to the American east coast north of Hatteras, where fogginess was experienced on 5 to 10 days, mainly during the latter half of the month.

OCEAN GALES AND STORMS, NOVEMBER, 1931

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
San Blas, Pan. S. S.	Castilla	Boston	16 40 N	85 30 W	Nov. 1	6 a., 2	Nov. 2	29.78	WSW	WNW, —	NW	WSW, 9	WSW-WNW.
Dresden, Ger. S. S.	Galway	New York	51 11 N	27 01 W	Nov. 3	Noon, 3	Nov. 3	29.04	WNW	—, 11	WNW	NW, 11	
Saccarappa, Am. S. S.	Sluiskill	Charleston	47 00 N	13 12 W	Nov. 2	7 a., 3	Nov. 4	29.32	SSW	SW, 9	W	SW, 10	SSW-WNW.
Seminole, Br. S. S.	Ellesmere Port.	Baton Rouge.	51 43 N	6 38 W	do	Mdt., 3	do	29.07	S	SW, 10	W	SW, 10	SW-W.
Santa Marta, Am. S. S.	Honduras	New York	17 00 N	86 57 W	Nov. 3	4 a., 4	do	29.85	WNW	NW, 8	N	NW, 8	WNW-N.
Manistee, Br. S. S.	Liverpool	Jamaica	47 03 N	16 59 W	Nov. 5	8 p., 6	Nov. 9	28.97	S	WNW, 10	W	—, 10	WNW-NW.
Tachira, Am. S. S.	New York	Venezuela	25 41 N	68 48 W	Nov. 7	10 a., 7	Nov. 10	29.78	NE	NE, 8	ENE	NE, 9	NE-ENE.
Oranian, Br. S. S.	Halifax	Bristol Channel.	47 21 N	49 47 W	do	8 a., 7	Nov. 7	29.21	W	W, 3	NNW	NW, 10	
Emanuel Nobel, Belg. S. S.	Philadelphia	Manchester	43 55 N	45 22 W	Nov. 8	Mdt., 8	Nov. 9	29.57	NW	NW, 10	NW	—, 10	NW-NNW.
Braheholm, Swed. S. S.	Newcastle-on-Tyne.	Portland, Me.	55 20 N	29 54 W	do	10 p., 8	Nov. 10	28.22	SE	NE, 4	NW	NW, 11	NE-N.
New York, Ger. S. S.	Cherbourg	New York	49 00 N	24 42 W	do	2 p., 8	do	28.74	S	—, 10	NW	—, 12	S-W-NW.
Kattegat, Ger. M. S.	Batum	Hamburg	46 40 N	6 31 W	Nov. 5	—, 8	Nov. 8	28.92	WSW	W, 8	N	WSW, 10	W-NW.
Southern Prince, Br. M. S.	New York	Rio de Janeiro.	30 44 N	60 57 W	Nov. 8	4 a., 9	Nov. 9	29.77	ENE	NE, 9	SSE	NE, 9	NE-SE.
Carlier, Belg. S. S.	Antwerp	New York	49 20 N	21 10 W	do	2 p., 9	Nov. 10	29.09	WSW	W, 11	WNW	NW, 11	WSW-WNW.
Clairton, Am. S. S.	New York	Manchester	50 50 N	17 00 W	Nov. 7	4 a., 10	do	28.66	SSW	W, 7	W	W, 10	SSW-W.
Vincent, Am. S. S.	Havre	New York	48 25 N	11 02 W	Nov. 9	4 a., 10	Nov. 11	28.85	WSW	WSW, 10	WSW	WSW, 10	Steady.
Wytheville, Am. S. S.	Rotterdam	Boston	50 55 N	21 50 W	Nov. 12	5 a., 13	Nov. 14	28.78	S	S, —	W	W, 10	S-SW-W.
Emanuel Nobel, Belg. S. S.	Philadelphia	Manchester	50 31 N	21 33 W	Nov. 13	—, 13		28.88	S	S, 10	W	SSW, 12	
Europa, Ger. S. S.	Cherbourg	New York	49 17 N	23 14 W	Nov. 12	2 a., 13	Nov. 15	28.87	S	—, 10	ENE	WNW, 11	
Tuscarora, Br. S. S.	Glasgow	Galveston	50 27 N	18 08 W	Nov. 13	7 a., 13	Nov. 14	29.32	SSW	SSW, 11	S	—, 11	S-SW-W.
Schenectady, Am. S. S.	Copenhagen	Portland, Me.	58 45 N	8 00 W	do	4 p., 13	Nov. 21	29.19	SSE	S, 8	NW	NW, 11	S-SW.
Forthbank, Br. S. S.	New Orleans	Canal Zone	15 38 N	81 15 W	do	4 p., 14	Nov. 14	29.84	ENE	E, 7	ESE	E, 9	E-ESE.
West Chatala, Br. S. S.	Galveston	Havre	44 16 N	44 15 W	Nov. 14	11 p., 14	do	29.44	NNW	SSW, 10	NW	SSW, 10	SSW-NW.
Aquitania, Br. S. S.	New York	Southampton	41 32 N	56 21 W	Nov. 15	4 p., 15	Nov. 17	30.06	NW	NW, 8	NW	NW, 9	NW-NNW.
West Quechee, Am. S. S.	Hamburg	Galveston	40 20 N	22 44 W	Nov. 22	Noon, 22	Nov. 22	29.39	SSE	NE, 9	NNW	—, 9	SSE-E-NNW.
Ponce, Am. S. S.	New York	Porto Rico	31 15 N	70 18 W	Nov. 23	8 p., 23	Nov. 24	29.81	E	E, —	ESE	ESE, 10	E-ESE.
Prusa, Am. S. S.	Galveston	Barcelona	30 42 N	68 42 W	do	3 p., 23	do	29.90	ENE	ENE, —	E	—, 10	
Gulf Hawk, Am. S. S.	Las Piedras	Philadelphia	26 19 N	75 16 W	Nov. 24	Noon, 24	do	29.52	SW	SW, 7	N	W, 10	SW-W.
City of Hamburg, Am. S. S.	Hamburg	Baltimore	49 04 N	27 03 W	Nov. 22	Noon, 25	Nov. 27	29.24	S	W, 8	W	—, 10	W-NW.
Bremen, Ger. S. S.	Cherbourg	New York	47 06 N	37 18 W	Nov. 30	Mdt., 30	Dec. 1	28.98	SSE	—, 12	NW	—, 12	
Aden Maru, Jap. S. S.	Fowey, England.	Portland, Me.	46 53 N	38 55 W	Nov. 29	8 p., 3	do	29.15	S	SW, 11	WNW	SW, 12	S-SW-WNW.
Bellflower, Am. S. S.	Avonmouth	Baltimore	51 35 N	23 43 W	Nov. 30	3 a., 30	Nov. 30	29.68	SSE	SSE, 8	NW	SSE, 10	SSE-NNW.

OCEAN GALES AND STORMS, NOVEMBER, 1931—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH PACIFIC OCEAN			° ′	° ′				*Inches*					
Hakushika Maru, Jap. S. S.	Miike	Port Townsend.	49 07 N	154 10 E	Oct. 30	Mdt., 3	Nov. 4	29.33	S	S, 9	S	S, 9	Steady.
Emp. of Asia, Can. S. S.	Vancouver	Yokohama	45 35 N	158 11 E	Nov. 1	2 a., 2	Nov. 2	29.50	SW	W, 8	W	WNW, 10	SW-W-WNW.
Chief Capilano, Br. S. S.	do	do	48 15 N	166 45 E	Nov. 2	4 p., 2	Nov. 3	29.22	SW	WSW, 10	NW	W, 11	WSW-W.
Illinois, Am. S. S.	Portland	do	47 03 N	164 10 E	do	1 p., 2	Nov. 4	29.32	S	W, 11	N	W, 11	WSW-W.
Golden Wall, Am. S. S.	Hong Kong	San Francisco	46 09 N	172 30 W	do	1 p., 2	do	29.60	W	WSW, —	WNW	WSW, 9	WSW-W.
Tyndareus, Br. S. S.	Yokohama	Victoria	49 00 N	177 40 W	do	4 p., 4	do	29.06	WSW	WNW, 9	WNW	W, 10	WNW-NW.
Melville Dollar, Am. S. S.	Cebu, P. I.	Los Angeles	39 27 N	140 01 W	do	2 a., 3	do	29.41	NE	N, 10	W	NNE, 11	2 pts.
Satanta, Br. S. S.	Yokohama	San Pedro	44 43 N	178 18 W	do	8 a., 3	Nov. 5	29.37	WNW	W, 10	NW	W, 10	W-WNW.
Soyo Maru, Jap. M. S.	do	San Francisco	47 20 N	167 38 W	do	3 p., 3	do	29.11	W	WSW, 9	W	WSW, 9	WSW-SW.
Alaska, Am. S. S.	Seattle	Seward	Resurrection Bay, Alaska		Nov. 3	3 p., 4	Nov. 4	29.62	S	S, 6		S, 10	Variable.
Bellingham, Am. S. S.	Dairen	San Francisco	47 45 N	177 45 W	do	8 a., 3	Nov. 5	29.04	W	W, 8	NW	W, 9	W-WNW-W.
Ohioan, Am. S. S.	New York	Los Angeles	15 20 N	93 25 W	Nov. 4	4 p., 4	Nov. 4	29.84	NW	NW, 5	NW	N, 9	
Pres. Jefferson, Am. S. S.	Victoria	Yokohama	52 31 N	158 48 W	Nov. 3	4 p., 4	Nov. 7	28.70	SSE	WSW, 5	NW	NW, 8	WSW-W.
Lebec, Am. S. S.	Portland	San Pedro	45 38 N	124 17 W	Nov. 6	—	Nov. 6	29.94	S	S, 7	SSW	S, 8	Steady.
Helen Whittier, Am. S. S.	Balboa	San Francisco	15 00 N	94 10 W	Nov. 8	5 p., 8	Nov. 9	29.87	NNW	NNW, 6	NNW	NNW, 10	Do.
Stuart Dollar, Am. S. S.	Philippines	Los Angeles	15 15 N	128 00 E	Nov. 9	5 a., 9	do	29.68	NNE	E, 11	S	E, 11	ENE-E.
Hayo Maru, Jap. S. S.	Muroran	William Head	45 06 N	161 43 E	Nov. 10	11 p., 12	Nov. 13	28.55	S	NNW, 10	SW	WNW, 11	
Pres. Cleveland, Am. S. S.	Yokohama	Seattle	48 09 N	173 23 E	do	6 p., 12	Nov. 14	29.15	SE	SE, 9	S	SSE, 9	SE-S-WSW.
Tamaha, Br. S. S.	Hong Kong	San Pedro	22 00 N	116 14 E	Nov. 11	6 a., 11	Nov. 11	29.52	ENE	NNE, 10	SE	NE, 11	NNE-NE.
Melmay, Br. S. S.	Portland	Hankow	34 51 N	154 47 E	do	2 p., 11	Nov. 12	29.73	SSW	NW, 9	NW	NW, 9	SW-NW.
Iowa, Am. S. S.	Japan	San Francisco	41 48 N	179 55 W	do	Noon, 12	do	29.63	S	SE, 7	SE	S, 9	S-SE.
Meigs, Am. S. S.	Manila	do	38 13 N	135 11 W	Nov. 14	6 a., 14	Nov. 14	29.93	NW	NW, 8	NNW	NW, 8	Steady.
Golden River, Am. S. S.	Hong Kong	do	39 13 N	153 06 E	Nov. 17	1 p., 17	Nov. 17	29.59	W	NE, 9	NNE	NE, 9	W-NE.
Akagisan Maru, Jap. M. S.	Yokohama	do	45 57 N	172 23 W	Nov. 18	6 a., 19	Nov. 20	28.37	NE	W, —	SW	WSW, 9	ENE-W-WSW.
Lebec, Am. S. S.	San Pedro	Seattle	40 40 N	124 38 W	Nov. 22	2 p., 22	Nov. 23	29.99	NNW	N, 7	N	N, 8	Steady.
Michigan, Am. S. S.	Tabaco, P. I.	San Francisco	26 00 N	137 20 E	do	8 p., 23	Nov. 24	29.31	ESE	S, 10	NW	S, 10	S-SW.
Stuart Dollar, Am. S. S.	Philippines	Los Angeles	38 30 N	178 30 W	Nov. 23	4 p., 23	do	28.88	SE	SE, 4	NW	NNW, 12	
Defiance, Am. M. S.	Shanghai	San Pedro	31 26 N	133 00 E	do	Mdt., 23	do	29.59	NE	ENE, 11	N	ENE, 11	NE-ENE.
San Luis Maru, Jap. M. S.	Kudamatsu	Los Angeles	39 50 N	164 12 W	do	6 p., 23	do	29.11	SSE	SSE, 9	W	SSE, 9	SSE-S.
Golden River, Am. S. S.	Hong Kong	San Francisco	46 35 N	170 19 W	do	2 p., 25	Nov. 26	29.13	N	S, 11	SW	SSE, 12	SSE-S.
Emp. of Russia, Can. S. S.	Vancouver	Yokohama	52 30 N	157 00 W	Nov. 24	7 p., 24	Nov. 25	29.71	SSE	SE, 9	SW	SE, 9	SE-S.
Do	do	do	52 00 N	168 00 W	Nov. 25	8 a., 25	Nov. 27	28.76	SW	S, 11	SW	S, 11	
Reiyo Maru, Jap. S. S.	Muroran	Juan de Fuca	49 03 N	170 35 W	do	6 p., 25	Nov. 26	28.62	SE	S, 10	SW	SSW, 11	6 pts.
Oregon, Am. S. S.	Otaru	San Francisco	50 25 N	171 30 W	do	8 a., 25	do	28.44	SSE	SE, 11	W	S, 12	SE-S.
Hakubasan Maru, Jap. M. S.	Yokohama	do	45 10 N	175 33 W	do	5 a., 25	Nov. 27	28.63	SSW	SSW, 10	W	SSW, 10	1 pt.
Stuart Dollar, Am. S. S.	Philippines	Los Angeles	38 18 N	152 00 W	Nov. 29	9 p., 29	Nov. 30	30.05	N	N, 8	NNE	N, 10	N-NNE.
Defiance, Am. M. S.	Shanghai	San Pedro	41 24 N	163 30 E	do	3 a., 30	do	29.09	ESE	—, 8	NNW	NW, 11	SSW-W.
Golden Sun, Am. S. S.	Dairen	San Francisco	38 24 N	177 18 W	Nov. 30	Mdt., 30	do	29.77	S	NW, 8	NW	NW, 8	W-NW.
SOUTH ATLANTIC OCEAN													
Maria De Larrinaga, Br. S. S.	England	Nacochea, Argentina.	Nacochea		Nov. 4	1 a., 4	Nov. 4	29.51	SW	SW, —	NNW	SW, 10	SW-W.
Persier, Belg. S. S.	Buenos Aires	Santos	25 54 S	48 38 W	Nov. 7	4 a., 8	Nov. 8	29.43	NE	NNE, 9	NW	NNE, 9	NNE-NW.
Brasilien, Dan. S. S.	Hull	Buenos Aires	31 20 S	48 40 W	Nov. 15	4 a., 16	Nov. 17	29.24	NE	WSW, 10	SW	WSW, 10	NW-W-S.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure, November, 1931.—The average center of the Aleutian LOW in November was far to the westward of its October position, and lay over Bering Sea (St. Paul 29.50 inches, and Dutch Harbor 29.55 inches). At both these stations the pressure averages were below the normal for the month. Winter conditions of pressure, with some extremely great and rapid fluctuations in the barometer from day to day, were common to the whole Aleutian region. Instances of this great pressure variability are shown in the p. m. barometer readings at Dutch Harbor from the 23d to the 27th, which are as follows: 23d, 29.90 inches; 24th, 28.60; 25th, 29.68; 26th, 28.86; 27th, 29.80. Pressures above normal were found along the American coast from Kodiak eastward and southward to Tatoosh Island.

Fairly stable high pressure, with the average crest of the anticyclone over the eastern part of the ocean, prevailed in middle latitudes, while a continuing belt of moderately high pressure extended westward along lower middle latitudes to near the Asiatic coast. Here it expanded to include Japanese waters and the eastern seas of China. As usual to the season, in the Japanese region the anticyclone was considerably broken by the intrusion of frequent LOWS.

The following table gives barometric data for several island and coast stations in west longitudes, including Point Barrow on the Arctic Ocean.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean and adjacent waters, November, 1931, at selected stations*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow [1] [2]	30.00	+0.01	30.92	13th	29.20	28th.
Dutch Harbor [1]	29.55	−0.04	30.50	12th	28.60	3d.
St. Paul [1] [2]	29.50	−0.09	30.40	12th	28.40	3d.
Kodiak [1]	29.68	+0.12	30.36	24th	29.02	5th.
Midway Island [1]	30.05	−0.03	30.24	29th	29.70	17th.
Honolulu [3]	29.99	−0.03	30.12	4th	29.85	26th.
Juneau [3]	29.95	+0.19	30.59	25th	29.20	1st.
Tatoosh Island [3] [4]	30.02	+0.05	30.44	21st	29.28	16th.
San Francisco [3] [4]	30.05	−0.04	30.38	19th	29.67	14th.
San Diego [3] [4]	30.00	−0.02	30.20	19th	29.60	21st.

[1] P. m. observations in averages: a. m. and p. m. in extremes.
[2] For 29 days.
[3] A. m. and p. m. observations.
[4] Corrected to 24-hour mean.

Cyclones and storminess.—November, 1931, may be called a stormy month on the North Pacific. Moderate to intense progressive cyclones, as well as oscillating storms of the Aleutian LOW type, swept upper and middle